

PENNYPACK CREEK BRIDGE

Pennsylvania Historic Bridges Recording Project
Spanning Pennypack Creek at Frankford Ave. (U.S. Rt. 13)
Philadelphia
Philadelphia County
Pennsylvania

HAER No. PA-465

HAER
PA
SI-PHILA,
710-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD

National Park Service
1849 C Street, NW
Washington, DC 20240

HISTORIC AMERICAN ENGINEERING RECORD

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HAER No. PA-465

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Location: Spanning Pennypaek Creek at Frankford Avenue (U.S. Route 13), Philadelphia, Philadelphia County, Pennsylvania.

USGS Quadrangle: Frankford, Pennsylvania-New Jersey (1967, photorevised 1983).

UTM Coordinates: 18/498220/4432370

Date of Construction: Possibly 1697 or 1698.

Designer: Unknown.

Builder: Residents of Lower Dublin Township.

Present Owner: Pennsylvania Department of Transportation.

Present Use: Vehicular bridge.

Significance: This three-span stone arch bridge is the oldest surviving roadway bridge in America. It was originally an important crossing along part of the King's Highway connecting Philadelphia to Bristol — one of colonial America's earliest roads. In later years, it carried delegates traveling from New York to draft the Declaration of Independence in Philadelphia. The bridge was paved in 1803 and then widened in 1893 to accommodate streetcars, and it has undergone a number of structural changes in the twentieth century to keep it in operable condition. However, the three semicircular arches and much of the spandrel walls along the bridge's upstream side maintain their original construction. The bridge was listed in the National Register of Historic Places in 1988.

Historian: J. Philip Gruen, August 1997.

Project Information: This bridge was documented by the Historic American Engineering Record (HAER) as part of the Pennsylvania Historic Bridges Recording Project - I, co-sponsored by the Pennsylvania Department of Transportation (PennDOT) and the Pennsylvania Historical and Museum Commission during the summer of 1997. The project was supervised by Eric DeLony, Chief of HAER.

The oldest extant roadway bridge in the United States crosses Pennypack Creek along Philadelphia's Frankford Avenue. The three-span, 73'-0"-long stone arch bridge was once an important link on the King's Highway connecting Philadelphia to other major eastern seaboard cities, and a principal crossing for those who traveled to Philadelphia for the signing of the Declaration of Independence and the writing of the U.S. Constitution.¹ The 300-year-old bridge was recognized as an engineering landmark by the American Society of Civil Engineers in 1970 and earned a spot on the National Register of Historic Places as part of a statewide multiple resource nomination in 1988.² And yet the bridge, potentially one of the nation's engineering treasures, is somewhat unknown.

While the obscurity of the Pennypack Creek Bridge in the annals of American history remains somewhat puzzling, because of its many alterations, the span has failed even to generate much interest among engineering historians. The first major alterations date back nearly 200 years to 1803, when the original dirt road passing over the bridge was paved. The bridge was widened ninety years later to accommodate streetcars, and a masonry railing was added to the southern approach. The streetcar tracks were later removed and the road was re-paved to better serve motorized vehicles. Prior to this, part of the bridge's facade was reinforced with iron tie bars.

To prevent further decay, the stone arches were lined with concrete by the 1950s and a metal railing was affixed to the roadway. At some point, a decorative steel pedestrian railing was added. In the winter of 1996, debris smashed into one of the abutments and removed chunks of stone, necessitating the replacement of this stone with new pieces in 1997. The alterations and changes over the years seemingly make the bridge a shadow of its original self; those changes, many could argue, have severely compromised its original condition.

And yet these alterations have kept the Pennypack Creek Bridge in use over the years. Too often old stone bridges are demolished or bypassed by newer structures because they are deemed too costly to maintain. Furthermore, the overall appearance of the bridge, despite its many structural and cosmetic changes, remains similar to how it may have appeared at the time of its construction. Much of the original stonework along the west side of the bridge, for

¹ The bridge has been variously referred to as "King's Highway Bridge," and mainly in nineteenth-century sources as "Holmesburg Bridge" (the area around Pennypack Creek became known as Holmesburg during the eighteenth century, after Thomas Holme, William Penn's surveyor who originally purchased land there from the Native Americans and then passed his parcels of land along to his descendants). Both of these names, however, were also applied to a number of other bridges in the area.

² [Editor's note: Both ASCE and National Register nominations call the structure "Frankford Avenue Bridge," which, according to Temple University professor emeritus Dr. George Edburg-Olson, is incorrect; see Julian Walker, "This Name Debate Spans 300 Years," *North East Times* (7 January 1999). Edburg-Olson cites the name "Pennypack Bridge" in Delaware Valley Regional Planning Commission, *Inventory of Historic Sites* (Philadelphia: Delaware Valley Regional Planning Commission, 1969), 36, an inventory by the Philadelphia Historical Commission, and other sources. Previous documentation by the Historic American Buildings Survey (HABS No. PA-1786) refers to the bridge as "Pennypack Creek Bridge," the name used in this report.]

example, including the voussoirs over the main arches, is still in place. While the original east side of the bridge was obscured by widening in 1893, the new east side was sensitive to the original design. Today, the differences in age between the two sides is not immediately apparent.

The Pennypack Creek Bridge should be accorded proper consideration as a landmark of both regional and national import in transportation history and the history of bridge engineering. Its myriad changes, regardless of their departure from the original design, provide a many-layered glimpse into the changing tides of both rural and urban Philadelphia. What remains of its original fabric also provides an excellent example of a limited set of structures that help document the history of colonial America.

Stone Bridges and Early Roads in Pennsylvania

The Pennypack Creek Bridge was certainly not the first bridge built during the colonial era, although it is one of a very few that survive. There is evidence, for example, that a multi-arched stone bridge known as the "Great Bridge" was erected over the Charles River in Boston in 1662.

Colonial builders commonly built their bridges out of stone, employing techniques resembling those of builders in ancient Rome by using stone blocks to form arches supported by embankments, hillsides, or man-made buttresses. Stone has considerable compressive strength, but its lack of tensile strength necessitated small arch spans spaced closely together. Wooden bridges were occasionally constructed in colonial America, but wood's susceptibility to fire and rot prevented their longevity; thus, stone construction was more common. By the early nineteenth century, there were reports of a number of existing stone bridges built in the "lower counties" of Pennsylvania.³

Most of the early bridges were built as simple crossings over streams and rivers, but some were built in conjunction with the grading of early roads. The Pennypack Creek Bridge today sits along what originally was a Native American trail used by the Lenni-Lenape. The tribe crossed the creek at that point because it was not affected by changing tides. Prior to 1677, Swedish and Dutch settlers also used the trail and forded the waters at the Pennypack.

Later, the trail was incorporated into the system of "King's Highways" radiating from downtown Philadelphia. Construction of these roads was established by an act of the General Assembly of Pennsylvania, and carried out by orders from the Governor and the Provincial Council.⁴ Supervision of construction and maintenance for these highways, however, was

³ In 1808, the U.S. Secretary of the Treasury reported that "stone bridges are generally found across the small streams" in the "lower counties" of Pennsylvania. See Pennsylvania Department of Transportation, *Historic Highway Bridges in Pennsylvania* (Harrisburg: Pennsylvania Department of Transportation, 1986), 7.

⁴ The roads were cleared of brush and could be as wide as 50'-0". For more general information on the King's Highways, see Pennsylvania Department of Transportation, *Historic Highway Bridges*, 3, or Donald C. Jackson, "Roads Most Traveled: Turnpikes in Southeastern Pennsylvania in the Early Republic," in *Early American Technology: Making and Doing Things from the Colonial Era to 1850*, ed. Judith A. McGaw (Chapel Hill:

carried out by local authorities under the jurisdiction of county courts. The first of these King's Highways to be built, in 1674, extended from Philadelphia southwest to the Swedish trading post town of Fort Christina (now Wilmington, Delaware) via Chester, Pennsylvania. By 1681, this particular King's Highway was allegedly extended northward toward Trenton, New Jersey, via Bristol, New Jersey, and it became known as the Bristol Road. It would later be extended through New York City to New England, and it was the first official road to cross what would become the bridge site. But in 1681, travelers along the road were still required to ford Pennypack Creek.

William Penn and Lower Dublin Township

In 1683, William Penn, the founder of Philadelphia and the man for whom the state of Pennsylvania was named, granted 1,646 acres to his surveyor Thomas Holme in an area of Philadelphia surrounding Pennypack Creek, known at the time as "Lower Dublin Township."⁵ The same year, Penn appealed to the English Court at Upland on the Lower Delaware, asking that an order be given for the construction of a bridge over the Pennypack along the King's Highway. The request was made along with other presentments of the Grand Inquest of Philadelphia County, Second Court: "Wee present the want of a bridge — or a ferry over Takonie, Pennebecca, Poetquessin, Neshamaneh, and in general bridge or ferries over the whole creeks in the King's Road..."⁶

On 10 March 1683, a law was adopted by the General Assembly requiring the construction of bridges, within eighteenth months, across all small creeks and rivers along the King's Highway from the Falls of Delaware to the southernmost ports of Sussex County. The bridges were to be 10'-0" wide and include a railing along each side. The area around the bridges were to be cleared of "all trees Stubbs & stumps of trees" to facilitate horse and cart passage. They were to be erected by the inhabitants under the auspices of appointed "overscers"; those who failed to appear were to pay a fine of twenty shillings.⁷

University of North Carolina Press, 1994): 197-239.

⁵ According to a map drawn by Penn's surveyor Thomas Holme in 1687, Pennypack Creek was called "Dublin Creek" and bisected large plots of individually owned land. Prominent plots of land around the bridge site were owned by Holme and his sister-in-law, Eleanor. See "A Map of the Improved Part of the Province of Pennsylvania in America," 1867, in Richard S. Dunn and Mary Maples Dunn, *The Papers of William Penn*, vol. 3, 1685-1700 (Philadelphia: University of Pennsylvania Press, 1986): 643-49.

⁶ "Presentments of the Grand Inquest of Philadelphia County 1683, Second Court," in American Society of Civil Engineers, Philadelphia Section, "An Historical Perspective of the Frankford Avenue Bridge," in *The Frankford Avenue Bridge over Pennypack Creek* [brochure], 15 September 1970.

⁷ "Laws Made Att an Assembly Held Att Philadelphia in the Province of Pennsylvania the 10th Day of 1st Month March 1683," chap. 89, 10 March 1683, in Gail McKnight Beckman, *The Statutes at Large of Pennsylvania in the Time of William Penn*, vol. 1, 1680 to 1700 (New York: Vantage Press, 1976): 149. The same law, with slightly different wording, was enacted again on 31 May 1893. According to a law passed on 27 November 1700,

Until 1712, in fact, Pennsylvania's laws required all male inhabitants to spend a few days per year working to clear and repair roads. This law extended to the erection of bridges along these roads, which would have required the male residents of Lower Dublin Township to build the bridge.⁸ Their option, if they chose not to build it, was to pay taxes.

The request to build a bridge over those creeks along the King's Highway may not have been carried out for some time, for once Penn had moved to his new plantation-style home northeast of Philadelphia, he wrote to James Logan on 22 June 1700, asking him to "urgc the justices about the bridge at Pemepecka and Poquessin, forthwith for a carriage, or I cannot come to town."⁹ This letter is puzzling, however, for it is unclear whether those bridges had already been built, were still under construction, or were still in the planning stages.

References to bridges and roads in the minutes of the Provincial Council of Pennsylvania are equally perplexing. One record, in 1696, indicates that only with "great difficultie" were travelers able to move along the King's Road into Philadelphia, and on 28 October, orders were given to lay out a sufficient road. The bridge may have been built at this time, although on 11 September 1700, when other records indicate that the King's Highway was already built, acknowledgment of the need for a road leading to the "pemmapecca mill" from Philadelphia was noted in the minutes.¹⁰

There is evidence, however, that a bridge was ordered to be built over the "portquessing Creek" (north of Pennypack Creek along the King's Highway) on 10 June 1697.¹¹ No record of the actual construction of a bridge over Pennypack (or "pemmapecca") Creek, or acknowledgment of its completion, has yet been uncovered.

At any rate, the completion of the bridge probably had an immediate economic impact on its environs, even though few people — most of them Swedish settlers — actually resided in

workers were required to arrive no later than one hour after sunrise and had to work until one hour before sunset, with the exception of mealtimes. See "An Act for the Erection of Bridges and Maintaining Highways," chap. 57, 27 November 1700, in *The Statutes at Large of Pennsylvania from 1682 to 1801*, vol. 2, 1700 to 1712, (Pennsylvania: Clarence M. Busch, 1896): 73-74.

⁸ Edwin C. Bronner, "Village into Town 1701-1746," in *Philadelphia: A 300-Year History*, ed. Russell F. Weigley (New York: W. W. Norton and Company, 1982): 58-59. This law was altered in 1712 when residents were required to pay property taxes to township officers who, in turn, used the proceeds to hire workers.

⁹ Edward Armstrong, M. A., ed., "Correspondence Between William Penn and James Logan, Secretary of the Province of Pennsylvania, and Others: 1700-1750," in *Memoirs of the Historical Society of Pennsylvania* (Philadelphia: J. B. Lippincott and Company, 1870): 9-10.

¹⁰ *Minutes of the Provincial Council of Pennsylvania from the Organization to the Termination of the Proprietary Government*, vol. 1 (Philadelphia: Joseph Severns and Company, 1852), 587-88.

¹¹ *Minutes of the Provincial Council of Pennsylvania*, 1:514. It is likely the "pemmapecca mill" refers to the mill built in 1697, just downstream from the bridge.

Lower Dublin Township in the late seventeenth century.¹² The completion of the bridge was likely felt most significantly by the nearby "pemmapecca" grist mill, erected in 1697 along with a dam and a mill race along Pennypack Creek, just downstream from the bridge site.¹³

In its earliest days, people traveled considerable distances to grind their corn at the mill.¹⁴ While water transportation was most common for people traveling to and from the mill and the most convenient way for goods to be shipped from the mill, it is plausible that the new bridge boosted mill business by providing a reliable and convenient passageway for those traveling over land. Furthermore, the bridge probably had a significant, if somewhat indirect, impact as part of the King's Highway by heightening traffic along the road and aiding the overland trade route between the growing towns of Philadelphia and New York.

Bridge Details and Its History

The solid-spandrel, barrel-arched bridge features three single-centered arches (two of 25'-0" span and one of 12'-9") and an overall length between abutments of 73'-0". The arches are further supported by triangular shaped pier footings, or "noses," on each side of the central arch. The bridge's total length, including approaches, is 154'-5".¹⁵ The two taller arches have an underclearance of 16'-0" to the bed of the river and the smaller arch has one of 12'-8". Next to the bridge on its southeast side and built into the bank of the creek is a little tunnel for the mill race.

By 1725, the King's Highway had become a regularly traveled route between central Philadelphia and Frankford, and in 1756, one stagecoach company advertised a three-day trip to

¹² A county tax list from 1693 listed only twenty-seven "taxables" in the Lower Dublin Township. See Dunn and Dunn, *The Papers of William Penn*, 3:24.

¹³ William Penn referred to the mill as the "Pemmapecka Mill." Reference to the "Pemmapecka" is a derivation of the original Native American name for the creek. Until the early twentieth century, the word took on a variety of different spellings. For a discussion of the origin of this word, see I. Pearson Willits, "The Pennepack in Lower Dublin Township," in *Philadelphia History: Papers Read Before the City History Society of Philadelphia* (Philadelphia: History Society of Philadelphia, 1917): 241. The mill, which ground flour and corn, operated successfully until 11 October 1880, when a fire spared only its walls. It was apparently one of the earliest grist mills in the colonies. An 1836 *Philadelphia Evening Post* article noted the strength of the walls, even though it had been in operation for nearly 140 years. See Mary Blakiston, "A Few Facts and Traditions about the Lower Dublin Township," in *Philadelphia History*, 230.

¹⁴ People apparently traveled from Bustleton and the New Jersey shore, some rowing up the Delaware River to Pennypack Creek and up to the mill door. Over the years, the mill was joined by a saw mill, a cooper shop, and by 1812, a cotton factory. For more information on the mill, see Samuel Fitch Hotchkiss, *The Bristol Pike* (Philadelphia: G. W. Jacobs, 1893), 160-61.

¹⁵ Parts of the approaches may have been added over the years. Measurements are taken from a 1969 Pennsylvania Department of Highways bridge inspection report, which lists the arch spans as 24.92', 25.08', and 12.75'.

New York. By the late eighteenth century, with the Bristol Road now extending from Philadelphia to Boston, one rider reportedly traveled across the bridge after a five-day trip from Boston with news of the armed resistance at Lexington, Massachusetts. Later, people traveled over the bridge on their way to help draft the Declaration of Independence, and in 1889, Massachusetts delegates to the First Continental Congress crossed the bridge on their way to Philadelphia to help draft the United States Constitution. George Washington is said to have crossed the bridge a number of times, and in later years, General Lafayette and Ulysses S. Grant are thought to have crossed as well.¹⁶ A 1773 journal entry from Sarah Eve, the fiancée of Benjamin Rush, noted the beauty of the bridge's three arches and its construction in 1697 or 1698.¹⁷

The road from Philadelphia into Bucks County and beyond, while cleared of brush, nevertheless remained unpaved through the eighteenth century. Public works were practically non-existent in Philadelphia, and streets, even in the center city, were filthy and impassable.

Changes

In 1803, however, the Frankford and Bristol Turnpike Company developed and built a paved toll road extending along Front Street through the Frankford area to Bustleton and Morrisville. The bridge was located along the road, and construction of the toll road required paving the bridge. "Toll-gate number three" was erected at the south end of the bridge in 1803, and for years toll collectors took payments from farmers and other travelers.¹⁸

During the nineteenth century, the toll gate was closed at 10 p.m. or 12 a.m. and re-opened at 4 a.m. or 5 a.m., with the exception of market days, when it was only closed for about three hours. The toll booth was put out of service in June 1892, when this section of the turnpike was sold to the city of Philadelphia. The booth was destroyed shortly thereafter.¹⁹

The Frankford and Bristol Turnpike was one of numerous turnpikes built in Pennsylvania at the turn of the nineteenth century, all of which provided convenient movement and boosted economic activity, particularly during the winter months.²⁰ In the nineteenth century,

¹⁶ Willits, "The Pennepack in Lower Dublin Township," 249-50.

¹⁷ Hotchkin, *The Bristol Pike*, 19.

¹⁸ Blakiston, "A Few Facts and Traditions," 232.

¹⁹ Hotchkin's account of the Bristol Pike was published in 1893, shortly after the destruction of the toll house. Hotchkin notes that the "bridge is being widened, as the travel demands it"; see *The Bristol Pike*, 164. A photograph of the toll booth appears in Blakiston, "A Few Facts and Traditions," 231.

²⁰ For an account of the economic benefits of the early turnpike system, particularly regarding the Germantown and Perkiomen Turnpike that stretched from Philadelphia westward through Montgomery County, see Jackson, "Roads Most Traveled," 197-239.

approximately 2'-0"-long iron ties were nailed vertically above the belt course of the central span, presumably to prevent the stones from spreading.

The bridge primarily served horse and buggy traffic through the nineteenth century, but the rise of the streetcar in Philadelphia, which began by pulling horses along iron rails laid down throughout the city, would prove important to the bridge's future. Meanwhile, the bridge's strength was being tested. While the nineteenth century saw the construction — and eventual disintegration — of the first major spans over the Schuylkill River, the Pennypack Creek Bridge withstood an 1860s flood that topped the roadway and turned the mill race into a lake. The bridge suffered only a crack in the center, but this prevented traffic from crossing for a few days.²¹

Philadelphia's phenomenal growth during the nineteenth century necessitated more housing construction, and northern Philadelphia began to expand. By the 1890s, the development had become dense enough along Frankford Avenue to merit the extension a trolley line northward into Bucks County. To accommodate the trolley, the bridge was widened on its eastern side in 1893. The reconstruction, which cost \$14,750.00 and was carried out by Charles A. Porter, included the regrading of Frankford Avenue over the bridge and its approaches. A still-extant rubble masonry wall flanking the approach on the south side was built at this time. The roadway, raised up on top of the arches, was extended to its current 36'-0" width (and the bridge's clear width to 50'-0"). Sidewalks were also added, one 7'-5" wide and the other 7'-10".²² A reconstruction photograph taken on 15 August 1893 shows that wooden falsework was erected under the arches to assist the project.²³ Fourteen bridge workers posed for the photograph. On 3 October 1895, the first trolley was put into service along Frankford Avenue between Cedar Hill (at Frankford Avenue and Bridge Street) and Poquessing Creek.

By 1915, the trolley was sharing the road with automobiles, and the bridge began to decay. In 1937, the bridge was declared a part of a defense highway by an act of Congress, and by 1955, the trolleys were replaced by buses. At some point, the original parapets were removed and replaced with 4'-0"-high steel railings. To guard against further deterioration and to strengthen the structure overall, the arches were lined with a thin layer of concrete. This concrete reinforcement extends from the upstream side through most of the barrel, but stops approximately two feet short of the downstream side. By early 1994, stones had fallen out of one

²¹ Blakiston, "A Few Facts and Traditions," 232.

²² Philadelphia Department of Public Works, *Third Annual Message of Edwin S. Stuart, Mayor of the City of Philadelphia with Annual Report of James H. Windrim, Director of the Department of Public Works and of the Bureau of Surveys for the Year Ending December 31, 1893* (Philadelphia: Dunlap Printing Company, 1894), 124-25; Willits, "The Pennypack in Lower Dublin Township," 248. Even by nineteenth-century standards, the bridge was apparently too narrow for horse and buggy traffic.

²³ "Frankford Avenue Bridge over Pennypack Creek," folder 629, photographic collection, Philadelphia City Archives, Philadelphia, Pennsylvania.

of the noses, heavy debris surrounded the bridge, and the masonry required re-pointing. In 1997, new stones were installed in the nose.

Recognition?

The many changes have seemingly lessened the overall integrity, and thus the significance, of the bridge in the eyes of preservationists and architectural historians. The bridge, for example, does not even appear in the leading architectural guidebook to Philadelphia, while other bridges do.²⁴

In recent years, the bridge began to garner the kind of recognition it deserves, but only very slowly. On 21 May 1969, members of the Philadelphia section of the American Society of Civil Engineers (ASCE) nominated the bridge to be recognized as a National Historic Civil Engineering Landmark, and it was approved by the Committee on the History and Heritage of American Civil Engineering in April of 1970. The local chapter hosted a ceremony on 15 September 1970, which included speeches, a band, and the installation of a plaque. Although the ASCE had recognized the bridge as a landmark in 1970, it was not until 1988 that it was listed on the National Register of Historic Places. Its National Register nomination, however, was part of a multiple listing and included forty-eight other stone bridges statewide, thereby denying the bridge any particular significance. In 1996, the bridge was filmed for use in a Japanese television documentary of "Bridges of the World."²⁵ The Friends of the Pennypack Park, in 1997, were preparing to host a celebration honoring the bridge's 300th birthday.

The Pennypack Creek Bridge may not be in — or even close to — its original state, but its current condition, revealing a palimpsest of time and changes that reflect shifts in political and economic circumstances, allows it to serve as a living document of American history. It is, after all, one of a very few structures in the United States that has remained operable for its intended use since the seventeenth century. It participated in America's road to revolution and suffered many alterations over the years.

And yet, the Pennypack Creek Bridge lives on. That it provides such an interesting example of shifts over time is indicative of its frequent use and its urban setting. Its myriad changes beg the question of integrity — particularly regarding issues of preservation — but that issue deserves more attention than can be given here. Regardless of its alterations, the Pennypack Creek Bridge remains enormously significant for its age and its role in colonial American history.

²⁴ The reference here is to Edward Teitelman and Richard W. Longstreth, *Architecture in Philadelphia: A Guide* (Cambridge, Massachusetts: MIT Press, 1974). The book includes the seemingly more impressive Benjamin Franklin, Strawberry Mansion, and Henry Avenue (Wissahickon Memorial) Bridges, in addition to buildings of some architectural note in the vicinity of the Pennypack Creek Bridge.

²⁵ Suzanne Sataline, "TV Crew to a Bridge: Say Cheese," *Philadelphia Inquirer* (16 September 1996): B-1.

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